

Listing of Claims

1. ~ 6. (Canceled)

7. (Currently Amended) A multi-modal browser, comprising:

a plurality of modality-specific browsers, and

a multi-modal shell that parses and processes a modality-independent representation of an application to generate modality-specific representations of the application which are rendered by corresponding modality-specific browsers to generate modality-specific views of the application, and to manage synchronization of I/O (input/output) events across each modality-specific view,

wherein each modality-specific browser comprises:

an API (application programming interface) that enables the multi-modal shell to control the browser and access events; and

a wrapper interface that support synchronization between the modality-specific views by event filtering and exchanging synchronization information between the multi-modal shell and the browser,

wherein the multi-modal shell comprises:

a model manager for maintaining a dialog state of the application;

a TAV (transformation/adaption/view preparation) manager for preparing and transforming pages or page snippets; and

a synchronization manager for managing event notifications to the browsers.

8. (Previously Presented) The multi-modal browser of claim 7, wherein the API for a modality-specific browser comprises a DOM (document object model) interface.

9. (Original) The multi-modal browser of claim 8, wherein the wrapper interface comprises methods for DOM event filtering.

10. (Original) The multi-modal browser of claim 7, wherein the multi-modal shell maintains and updates a dialog state of the application.

11. (Original) The multi-modal browser of claim 7, wherein the multi-modal browser comprises a fat client framework.

12. (Original) The multi-modal browser of claim 7, wherein the multi-modal browser comprises a distributed framework.

13. (Canceled)

14. (Currently Amended) The multi-modal shell of claim 7 ~~13~~, wherein the multi-modal shell comprises a distributed framework.

15. (Previously Presented) The multi-modal browser of claim 7, wherein the plurality of modality-specific browsers comprise a WML (wireless markup language) browser and a VoiceXML browser.

16. (Original) The multi-modal browser of claim 15, further comprising an audio system for capturing and encoding speech data, and a plurality of speech engines for processing speech data.

17. (Canceled)

18. (Currently Amended) The WAP multi-modal browser of claim 20 ~~17~~, wherein the GUI browser comprises a WML (wireless markup language) browser and wherein the voice browser comprises a VoiceXML browser.

19. (Canceled)

20. (Currently Amended) ~~The WAP multi-modal browser of claim 19, further comprising~~
A distributed WAP (wireless application protocol) multi-modal browser system, comprising:
a GUI (graphical user interface) browser that resides on a client device, wherein the GUI
browser comprises a DOM (document object model) interface for controlling the GUI browser
and managing DOM event notifications, and a wrapper interface for filtering events;
a speech application server comprising:

a voice browser, wherein the voice browser comprises a DOM interface for controlling the voice browser and managing DOM event notifications, and a wrapper interface for filtering events; and

an audio system for capturing and encoding speech data; and one or more speech engines for processing speech data,

wherein the speech application server is distributed over a network;

a multi-modal shell system for parsing and processing a modality-independent application and managing synchronization of I/O (input/output) events between the GUI and voice browsers;
and

a communication manager that employs protocols for transporting encoded voice data to the speech engines and protocols for enabling synchronization of the GUI browser.

21. (Currently Amended) The WAP multi-modal browser of claim 20 ~~19~~, wherein the speech application server supports protocols for enabling remote control of the engines for server side speech processing.

22. (Currently Amended) The WAP multi-modal browser of claim 20 ~~19~~, wherein the multi-modal shell system is distributed over the network.

23. (Previously Presented) A multi-modal browser, comprising:
a plurality of modality-dependent browsers, and

a multi-modal shell for parsing and processing a modality-independent application and managing synchronization of I/O (input/output) events across each view generated by the plurality of modality-dependent browsers,

wherein each modality-dependent browser comprises:

an API (application programming interface) for controlling the browser and for managing events; and

an external wrapper interface comprising synchronization protocols for supporting synchronization of the browser, and

wherein the multi-modal shell comprises:

a model manager for maintaining a dialog state of the application;

a TAV (transformation/adaption/view preparation) manager for preparing and transforming pages or page snippets; and

a synchronization manager for managing event notifications to the browsers.